Measurements International

Metrology is Our Science, Accuracy is Our Business™

Transformer and Reactor Loss Measurement Systems ALMS and RLMS

Accurate. Defensible. Fast.

www.mintl.com • sales@mintl.com

Confidence in Every Transformer You Deliver

You are expected to meet strict efficiency guarantees—on time and without risk.

Loss measurement is where that performance is proven. At low power factors, even small uncertainties can impact margins, delay shipments, or lead to disputes.

That's why manufacturers rely on AccuLoss® (TLMS) and Reactor Loss Measurement Systems (RLMS) from Measurements International—delivering metrology-level accuracy on the factory floor.

Confidence That Protects Your Business

Accurate. Defensible. Compliant.

- High-precision measurement at extreme low power factors
- Results you can trust and defend in any test or audit
- Fully aligned with IEC 60076

Performance That Drives Results

- Increase throughput with fast, stable measurements
- Operate with confidence in real-world conditions
- Simplify testing with intuitive, automated workflows

Complete Loss Measurement Coverage

- TLMS – Transformer and Reactor loss measurement for production environments
- RLMS – Dedicated reactor loss measurement systems
- One integrated solution across your full product range

The Result

- Reduced financial risk
- Improved production efficiency
- Greater confidence in every test

Confidence That Wins Business

With TLMS and RLMS, you remove uncertainty from loss measurement—and gain a competitive advantage on every unit you deliver.

Features & Benefits

Feature	Benefit
Industry-Leading Measurement Accuracy	Ensures confidence in results, even at PF = 0.01, supporting compliance with global standards and improving product quality.
Simultaneous Sampling Technology	Eliminates phase errors and delivers fast, stable, and highly repeatable measurements.
Scalable to 6000 A / 800 kV	Supports testing from distribution to ultra-high-voltage transformers within a single platform.
Modular System Architecture	Enables easy upgrades and integration into existing facilities, protecting long-term investment.
Flexible Test Configurations	Accommodates horizontal and vertical bushings and a wide range of transformer designs.
Optimized for Low Power Factor	Maintains high accuracy under the most challenging measurement conditions.
Supports Energy-Efficient Design	Helps manufacturers reduce transformer losses and meet increasing efficiency requirements.
Environmentally Responsible Design	Contributes to reduced emissions and supports ESG and sustainability initiatives.

Overview

The AccuLoss® Transformer Loss Measurement System (TLMS) and Reactor Loss Measurement Systems (RLMS) from Measurements International Limited are metrology-grade solutions designed for precise measurement of transformer and reactor losses. Engineered for modern high-voltage testing, these systems deliver industry-leading accuracy, even under challenging conditions such as extremely low power factor measurements (PF = 0.01).

Using precision voltage dividers and advanced simultaneous sampling power analyzer technology, TLMS and RLMS provide fast, stable, and highly repeatable results, making them well suited for both production and laboratory environments.

Built on proven metrology principles, the system is simple to calibrate using traceable reference standards. This reduces complexity and downtime while ensuring long-term confidence in measurement accuracy. The modular and scalable architecture supports configurations up to 800 kV and 6000 A, enabling seamless integration into new or existing test facilities across a wide range of applications.

The system supports a comprehensive range of testing applications, including load and no-load loss measurements, heat run testing, induced voltage testing, and reactor calibration at very low power factors. Integrated software provides automated test sequences, waveform analysis, and flexible data output, improving efficiency while maintaining consistent, high-quality results.

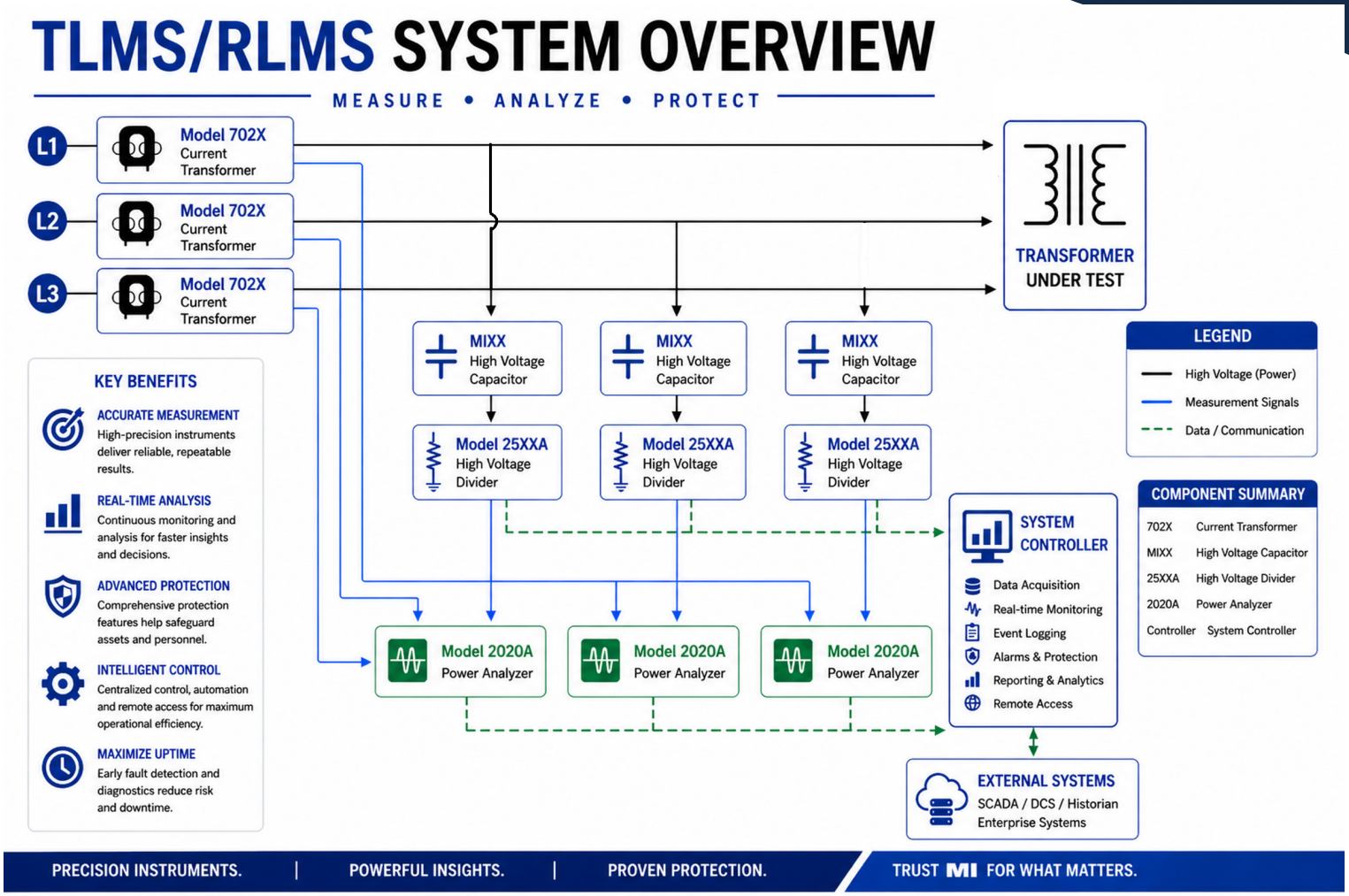
Optional oil-filled current transformers (CTs), including electronically aided and compensated designs, further extend system capability—allowing a single platform to support both transformer and reactor testing with high accuracy and stability.

Capabilities and Applications

Accurate. Defensible. Compliant.

- Performance of Load and No-Load Loss Measurements
- Heat Run Test
- Induced Voltage Test
- Zero Sequence Impedance Measurements
- “Operator Friendly” software includes voltage and current waveform analysis, manual and fully automatic time-saving range selection, over-voltage, and over current protection.
- **Output Data:** Supplied in an ASCII file for easy import into Excel spreadsheets.
- **Electromagnetic Compatibility:** All components comply with the requirements of IEC Recommendations. In addition, the electronics is housed in one shielded enclosure.

The AccuLoss® System is designed to test small, medium, and large power transformers, motors, and turbines up to 400 Hz and is ideal for R & D facilities. The AccuLoss® System also calibrates single and 3-phase reactors at power factors down to 0.001 and lower.



Power Factor Accuracy Performance

Power Factor	Range	Accuracy
cos Φ = 1.000	≥ 100 V ≥ 1 A	0.03 %
cos Φ = 0.100	≥ 100 V ≥ 1 A	0.04 %
cos Φ = 0.050	≥ 100 V ≥ 1 A	0.06 %
cos Φ = 0.020	≥ 100 V ≥ 1 A	0.13%
cos Φ = 0.010	≥ 100 V ≥ 1 A	0.27 %
cos Φ = 0.005	≥ 100 V ≥ 1 A	0.54 %
cos Φ = 0.001	≥ 100 V ≥ 1 A	2.74%

Accuracy specifications are calculated for an ambient temperature of 25 °C, ± 10 °C, and are of full scale. If the ambient temperature is less than or greater than 10 °C, contact Measurements International for an updated accuracy specification.

Simple 5-Step Selection Process

1. **Select System Type**
   → TLMS or RLMS
2. **Choose Current Rating**
   → (kA requirement)
3. **Choose Voltage Rating**
   → (kV requirement)
4. **Select Configuration**
   → Horizontal/Vertical or Stand Alone/Oil CT

   Note:
   Horizontal Bushing only available up to 100 kV

   Note:
   Stand Alone CT Only Available in RLMS Systems
5. **Select Class**
   → Standard or Premium

MODEL SELECTION GUIDE

AccuLoss® Transformer (TLMS) & Reactor Loss Measurement Systems (RLMS)

TLMS – 2100 – V – P

- P → System Class (**S**tandard / **P**remium)
- V → Configuration (**H**orizontal / **V**ertical/**S**tand Alone/**O**il) CT
- 2100 → Rating Code (1st digit Current in kA, next is kV)
- TLMS → System Type (TLMS / RLMS)

Example:

TLMS-2100-H-P → 2 kA, 100 kV, Vertical, Premium System

Transformer Loss Measurement Systems (TLMS)

Model Series	Maximum Current	Voltage Capability
2100 – 2300	Up to 2 kA	Up to 300 kV
3100 – 3300	Up to 3 kA	Up to 300 kV
4100 – 4300	Up to 4 kA	Up to 300 kV

Reactor Loss Measurement Systems (RLMS) with Stand Alone CT

Model Series	Maximum Current	Voltage Capability
2300 – 2800	Up to 2 kA	300 – 800 kV
4300 – 4800	Up to 4 kA	300 – 800 kV
6300 – 6800	Up to 6 kA	300 – 800 kV

CT Option - Oil Filled

Optional oil-filled current transformers (CTs) are available, including electronically aided and compensated designs. These configurations extend measurement capability and allow a single system to support both transformer and reactor testing, providing a flexible, high-performance solution across a wide range of applications. Contact MI for Details

On Site Calibration

Measurements International provides complete on-site system calibration for TLMS and RLMS platforms, along with individual component calibration services. When components are returned one at a time for calibration, loaner units are supplied to maintain uninterrupted operation and avoid any disruption to your testing schedule.

Options:

Spare components such as the 2500A, the 2020A, and the PC controller are available. Accredited 17025 Calibration on all the components is also available on these Models including on-site calibrations. An optional CT stand is also available for horizontal bushing. All CTs are protected from power outages.

- Model 7203A CAL - 17025 (ISO/IEC 17025 Accredited Certificate of Calibration)
- Model 25XXA CAL - 17025 (ISO/IEC 17025 Accredited Certificate of Calibration)
- Model 2020A CAL - 17025 (ISO/IEC 17025 Accredited Certificate of Calibration)

Specifications:

HV Bushing Style	Horizontal			Vertical		
Voltage						
Applied Voltage Line to Neutral	100 V to 100 kV			100 V to 100 kV	100 V to 200 kV	100 V to 300 kV
Accuracy	≤ 0.05 % of full scale					
Current						
Applied Current (A)	1 to 2000	1 to 4000	1 to 6000	1 to 4000	1 to 6000	1 to 4000
Input Current Ratio	2000:1			2000:1		
Accuracy	≤ 0.005 % of full scale					
Ranges, A (Blue - Premium) Note: All CT's are protected against power outages.	10 20 40 100 200 400 1000 2000	10 20 40 100 200 400 1000 4000	10 20 40 100 200 400 1000 6000	10 20 40 100 200 400 1000 4000	10 20 40 100 200 400 1000 6000	10 20 40 100 200 400 1000 4000
Power						
Power Factor	1, 0.1, 0.05, 0.02, 0.01, 0.005, 0.002, 0.001					
Accuracy	≤ 0.05 % to ≤ 1.21 %					
Saftey Clearances						
To Adjacent Walls	1.3 m			2.6 m : 3.9 m for 300 kV		
Between Phase	1.3 m			2.6 m : 3.9 m for 300 kV		
Power Supply						
Voltage	100, 120, 220, 240 V ± 10 %					
Frequency	50/60 Hz					
Power	1200 VA					
Environmental Conditions						
Operating Temperature	Control Cabinet: 15 °C to 30 °C, Bushings and Capacitors: 0 °C to 40 °C					
Storage Temperature	- 20 °C to 50 °C					
Relative Humidity	30 % to 90 % (non condensing)					

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